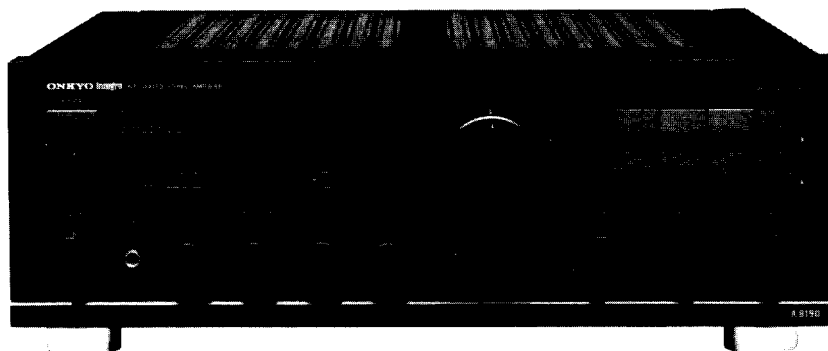



# ONKYO® SERVICE MANUAL

## Integrated Stereo Amplifier MODEL A-8190



UD	120V AC, 60Hz
UG	220V AC, 50Hz
UQ	240V AC, 50Hz
UW, UWX	120V/220V AC, 50Hz/60Hz

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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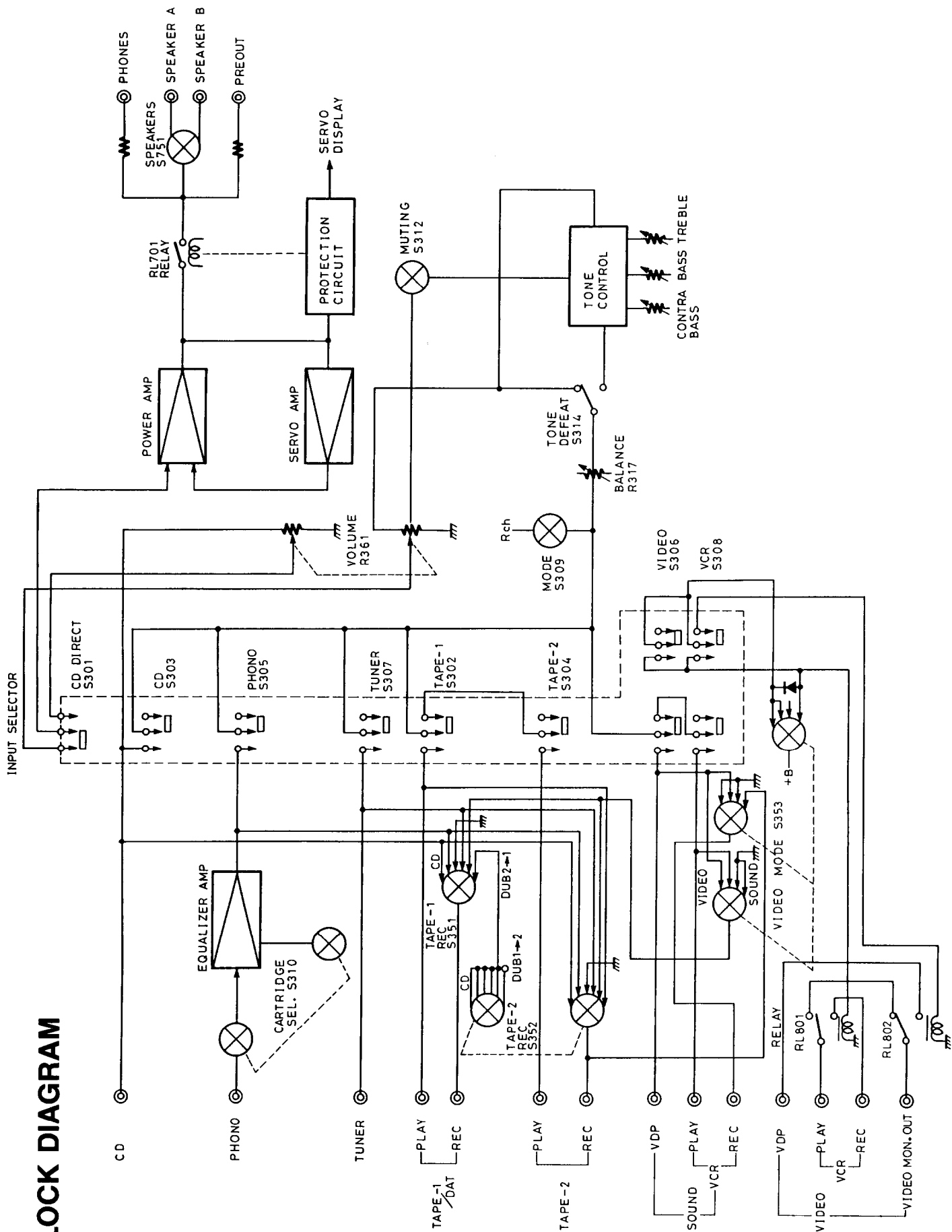
**ONKYO**  
**AUDIO COMPONENTS**

## SPECIFICATIONS

Power Output:	100 watts per channel, min RMS. at 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.008% Total harmonic distortion.
Dynamic Power:	303 watts 2 ohms, 235 watts 4 ohms
Total Harmonic Distortion	0.008% at rated power 0.008% at 1 watt output
Intermodulation Distortion:	0.005% at rated power
Damping Factor:	50 at 8 ohms
Input Sensitivity/ Impedance:	Phono (MM): 2.5 mV/50 kohms Phono (MC): 160 $\mu$ V/220 ohms CD DIRECT: 150 mV/50 kohms TUNER: 150 mV/50 kohms Tape Play: 150 mV/50 kohms VCR Play: 150 mV/50 kohms VDP Play: 150 mV/50 kohms
Output Level/Impedance:	Tape Rec: 150 mV/1.5 kohms (Phono) Pre Out: 1 V/600 ohms
Phono Overload:	Phono (MM): 200 mV RMS. at 1 kHz, 0.015% THD.
Tone Control (Vol -20 dB):	CONTRABASS: +10/+20 dB (Muting: OFF/ON) at 20 Hz BASS: $\pm$ 10 dB at 70 Hz TREBLE: $\pm$ 8 dB at 20 kHz
High Cut:	6 kHz (6 dB/Octave) (TREBLE min.)
Frequency Response:	CD, Tuner: 2 Hz-50 kHz (+0, -1 dB)
RIAA Deviation:	Phono (MM): $\pm$ 0.3 dB, 20 Hz-20 kHz
Signal to Noise Ratio (IHF-A):	Phono (MM): 94 dB (5 mV input) Phono (MC): 75 dB (0.5 mV input) CD DIRECT: 107 dB
Muting (Vol -20 dB):	-15 dB
Power Supply:	USA & Canadian models: AC120V, 60 Hz European models: AC220V, 50 Hz U.K & Australia models: AC240V, 50 Hz Worldwide models: AC120V 60Hz and AC220V 50Hz switchable
Dimensions:	435(W) x 157(H) x 396(D) mm 17-1/8" x 6-3/16" x 15-9/16"
With side panels:	465(W) x 158(H) x 396(D) mm 18-5/16" x 6-2/8" x 15-9/16"
Weight:	13.2 kg, 29.1 lbs.
With side panels:	14.6 kg, 32.2 lbs.

Only PX. models are equipped with wood grain side panels.

# BLOCK DIAGRAM



## ADJUSTMENT PROCEDURES

### 1. Preparations

- 1) Leave the machine in a normal condition parallel to the work bench, maintaining a clearance of 15mm from the bottom for air circulation.
- 2) Set the level to minimum with no load and no signal.
- 3) When making the adjustment, there must be no breeze blowing from the outside.

### 2. Adjustment of idling current

- 1) Turn ON the power switch, and leave the unit as is for about 5 minutes.
- 2) Adjust the semi-fixed resistor R531 (R532) so that the voltage between the terminals  $V_{CT}$  and  $I_{ID}$  of the printed circuit board NAAF-2969 is 7.5mV.

### 3. Operating check of protection circuit

- 1) When the power switch is turned ON.
  - After about 6 second, relay RL701 of the NAAF-2969 printed circuit board go ON.
  - Operation indicator lights.
- 2) When the power is turned OFF.
  - Immediately a relay go OFF.
- 3) With no load, when  $\pm 200\text{mV}$  DC is CD input, the speaker relay go OFF.

Caution: During this test, there should be absolutely no load connected and the load terminals must not be shorted.

## PRECAUTIONS

### 1. Replacing the fuses

For continued protection against risk fire, replace only with same type and same rating fuse.

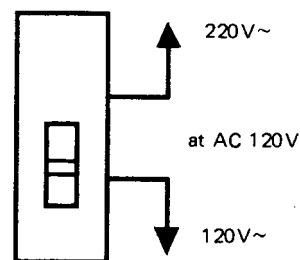
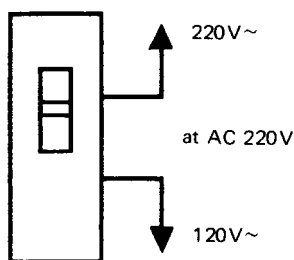
CIRCUIT NO.	PART NO.	DESCRIPTION
F901	252052	7 A(ST-6), Primary fuse (120V model)
F902	252077 or 252077CC	4 A-SE-EAK Primary fuse (220V, 240V, 120V/220V model) 4 A-SE-EAK Primary fuse (220V, 240V, 120V/220V model)

### 2. Insulation resistance measurement (Only U.S.A. model)

Connect the insulating-resistance tester between the plug of power supply cable and the terminal GND on the back panel. Specifications; More than 10 M $\Omega$  at 500V.

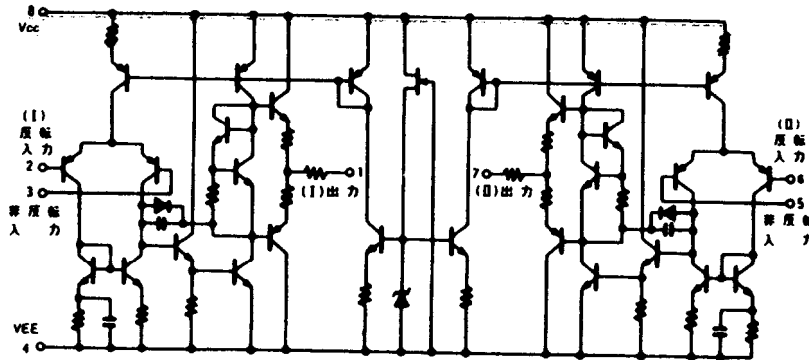
### 3. Voltage selector (rear panel)

Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver or similar instrument to up or down position. Confirm that the switch has been moved all the way to up or down before turning the power switch on. If there is no voltage selector switch on the unit you have purchased, it can only be used in areas where the power supply voltage is the same as that of the unit.

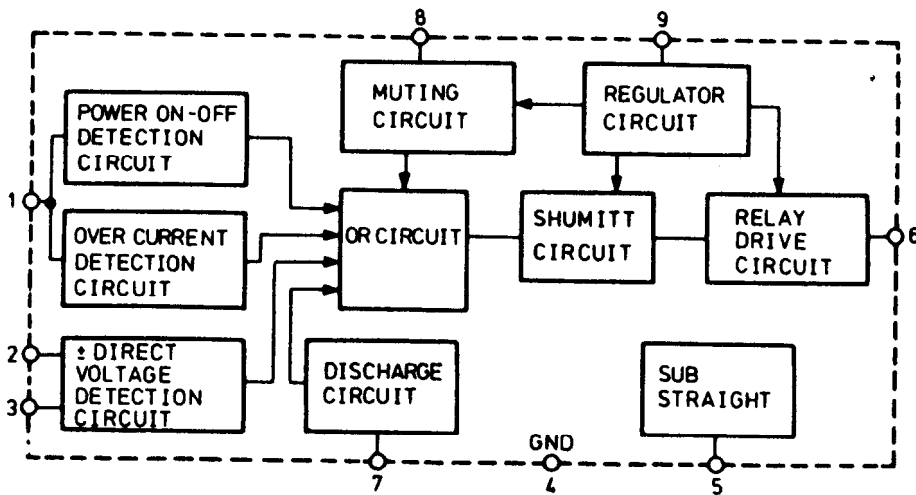


# IC BLOCK DIAGRAM

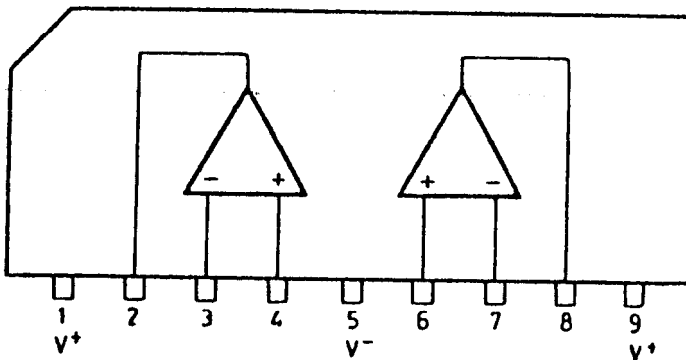
NJM-4560DX(OP Amp)



TA7317P(Protection Circuit)

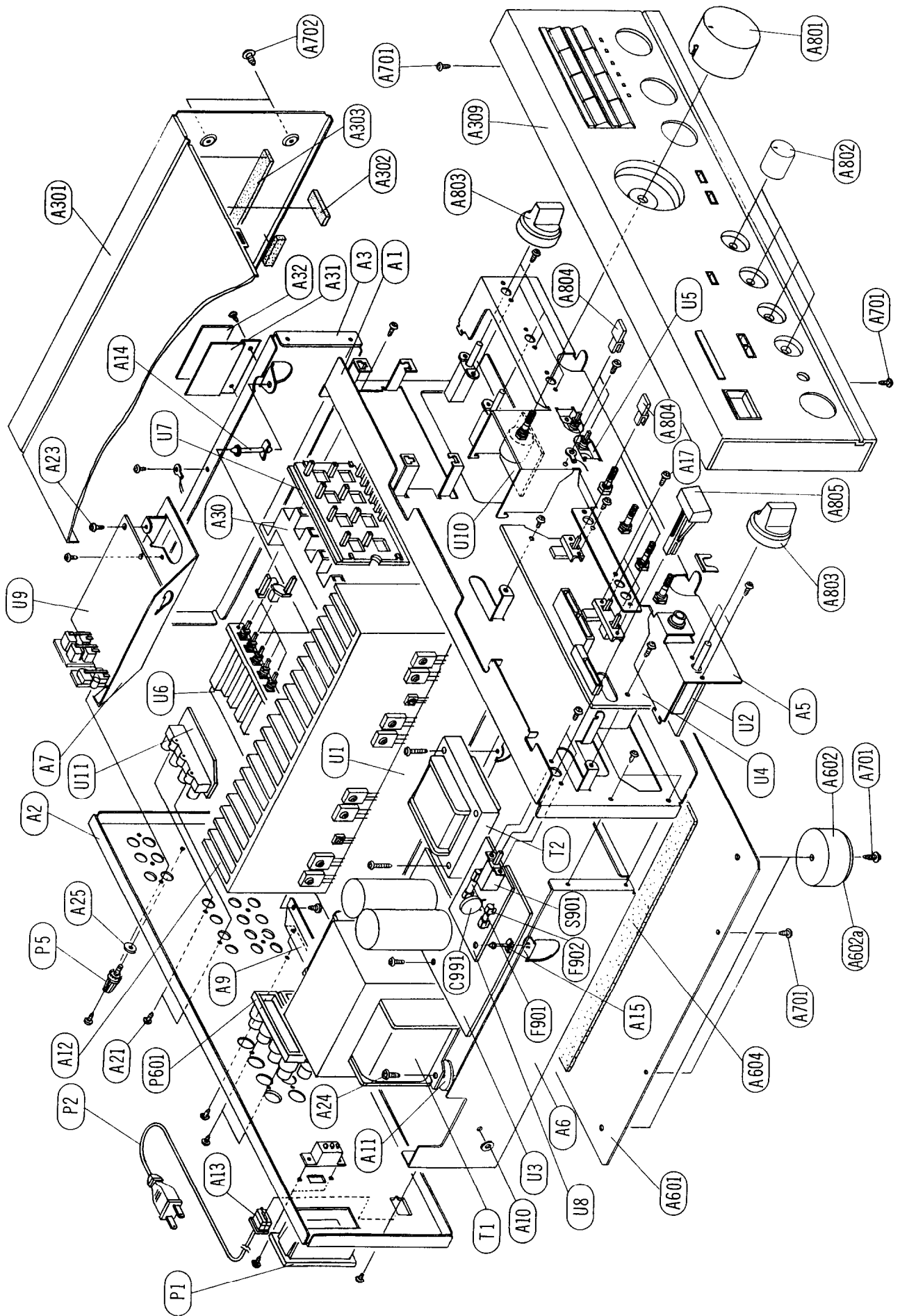


NJM-4558SE (OP Amp)





**CHASSIS-EXPLODED VIEW**



# CHASSIS-EXPLODED VIEW-PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
A1	27110305C	FRONT BRACKET	A805	28322702	KNOB (POW)	U1	2201696 or 2201694	2SA1491 P or 2SA1491 Y
A2	27120998	BACK PANEL	△T1	2300227A	POWER TRANSFORMER, NPT-935D	U2	1A030569-1	NAAF-2969-1, REC-SELECTOR AND POWER AMPLIFIER CIRCUIT PC BOARD ASS'Y
A2	27120999	BACK PANEL [G]	△T1	2300228A	POWER TRANSFORMER, NPT-935G [G]	U3	1A030570-1	NASW-2970-1, SPEAKER SWITCH PC BOARD ASS'Y
A2	27121001	BACK PANEL [W]	△T1	2300229	POWER TRANSFORMER, NPT-935DG [W][X]	U4	1A030573-1	NAPS-2973-1, POWER SUPPLY PC BOARD ASS'Y
A2	27121003	BACK PANEL [A][B]	△T1	2300240A	POWER TRANSFORMER, NPT-935Q [A][B]	U5	1A030574-1	NASW-2974-1, TONE AND MUTING SWITCH PC BOARD ASS'Y
A3	27115224	SIDE BRACKET	△T1	25035398	POWER SWITCH, NPS-111-L362P	U6	1A030576-1	NASW-2976-1, INPUT SELECTOR SWITCH PC BOARD ASS'Y
A5	27130448A	BRACKET (F)	△T2	231125	CHOKO COIL	U7	1A030577-1	NADIS-2977-1, DISPLAY LED PC BOARD ASS'Y
A6	27130449A	BRACKET (L)	△S1	25065123	SLIDE SWITCH, NSS-1258P [W][X]	U8	1A030578-1	NASW-2978-1, POWER SWITCH PC BOARD ASS'Y
A7	27130450	BRACKET (EQ)	△S901	25035398	POWER SWITCH, NPS-111-L362P	U8	1A030578-1A	NASW-2978-1A, POWER SWITCH PC BOARD ASS'Y
A8	28140730	CUSHION	△P1	25050293	AC SOCKET, NSCT-6P120 [D][X]	U8	[G][A][B]	NASW-2978-1A, POWER SWITCH PC BOARD ASS'Y
A9	27141084A	BRACKET (H)	△P2	253123 or 253136 or 253140	AC CORD, AS-UC-6#18 or [D][X]	U8	1A029578-1B	NASW-2978-1B, POWER SWITCH PC BOARD ASS'Y [W]
A10	27270212	SPACER	△P2	253130A or 253128B	AC CORD, AS-UC-6#18 [D][X]	U8	1A029578-1C	NASW-2978-1C, POWER SWITCH PC BOARD ASS'Y [X]
A11	27270213	SPACER (PT)	△P2	253130A or 253128B	AC CORD, AS-CEE or [G]	U9	1A030579-1	SWITCH PC BOARD ASS'Y [G]
A12	27160206	HEATSINK	△P2	253092-1A	AC CORD, AS-CEE-2 [W]	U9	1A030580-1	NAAF-2980-1, VOLUME CONTROL PC BOARD ASS'Y
A13	27300750	BUSHING (CORD)	△P2	253118	AC CORD, AS-SAA [A]	U10	1A030582-1	TROL PC BOARD ASS'Y
A14	27190164	HOLDER LCBS-14NS	△P2	728320 or 728328	AC CORD, 2-0.75BS16 BLK/GRY [B]	U11	1A030582-1	NAETC-2982-1, VIDEO TERMINAL PC BOARD ASS'Y
A15	27190062	HOLDER LCBS-12N			AC CORD, 2-0.75BS16 BLK/GRY [B]			
A17	82143006	PAN HEAD SCREW, 3P+6FNB			AC CORD, AS-UC-6#18 or [D][X]			
A21	834430108	TAP-TIGHT SCREW, 3TTS+10BBC			AC CORD, AS-UC-6#18 [D][X]			
A23	831130088	TAP-TIGHT SCREW, 3TTW+8B	△P2	253140	AC CORD, AS-UC-6#18 [D][X]			
A24	830440109	TAP-TIGHT SCREW, 4TTC+10CBC	△P2	253130A or 253128B	AC CORD, AS-CEE or [G]			
A25	87613010	WASHER, W3X10F	△P2	253092-1A	AC CORD, AS-CEE-2 [W]			
A30	27273059A	JOINT AS	△P2	253118	AC CORD, AS-SAA [A]			
A31	27150236	SHIELD PLATE	△P2	728320 or 728328	AC CORD, 2-0.75BS16 BLK/GRY [B]			
A32	28175140	INSULATING PLATE			AC CORD, 2-0.75BS16 BLK/GRY [B]			
A301	28184333A	TOP COVER			AC CORD, 2-0.75BS16 BLK/GRY [B]			
A302	28140020	CUSHION	P5	25060044	TERMINAL			
A303	28140695	CUSHION	P601, P602	25060108	TERMINAL, NTM-4PRMN42			
A309	1A029121	FRONT PANEL [D][G][W][A][B]	△F901	252052	FUSE, 7A ST-6			
A309	1A029121UWX	FRONT PANEL [X]	F901a	250113	FUSE HOLDER, S-NS051			
A310	28185286	SIDE BOARD LEFT [X]	△F902	252077 or 252077CC	FUSE, 4A-SE-EAK or [G][W][X][A][B]			
A311	28185287	SIDE BOARD RIGHT [X]			FUSE, 4A-SE-EAK			
A601	27170234B	BOTTOM BOARD			FUSE, 4A-SE-EAK			
A602	27175153	LEG ASSY	F902a	25050065	FUSE HOLDER, YSH403T			
(A602a)	28140747	CUSHION		3500065A	CAPACITOR (IS)			
A604	28140961	CUSHION, 25X140mm	△C991	2212864 or 2212863	2SC3419 Y or 2SC3419 O			
A701	834430088	TAP-TIGHT SCREW, 3TTS+8BBC	Q517, Q518	2212864 or 2212863	2SC3419 Y or 2SC3419 O			
A702	83844089	TAP-TIGHT SCREW, 4TTB+8CBC [D][G][W][A][B]	Q609, Q610	2201703 or 2201706 or 2201704	2SC3855 O or 2SC3855 P or 2SC3855 Y			
A702	836440303	TAPPING SCREW	Q611, Q612	2201693 or 2201696 or 2201694	2SA1491 O or 2SA1491 P or 2SA1491 Y			
A703	870086	4STV+30CQB [X]		2201703 or 2201706 or 2201704	2SC3855 O or 2SC3855 P or 2SC3855 Y			
A703	870086	SPECIAL WASHER 4X12BSBC [X]		2201693 or 2201696 or 2201694	2SA1491 O or 2SA1491 P or 2SA1491 Y			
A801	28323027	KNOB (VOL)	Q613, Q614	2201703 or 2201706 or 2201704	2SC3855 O or 2SC3855 P or 2SC3855 Y			
A802	28323029	KNOB (TONE)		2201693 or 2201696 or 2201694	2SA1491 O or 2SA1491 P or 2SA1491 Y			
A803	28322700	KNOB (SP)		2201703 or 2201706 or 2201704	2SC3855 O or 2SC3855 P or 2SC3855 Y			
A804	28322701	KNOB (PUSH)	Q615, Q616	2201693 or 2201696 or 2201694	2SA1491 O or 2SA1491 P or 2SA1491 Y			

NOTE [D] : ONLY 120V MODEL  
 [G] : ONLY 220V MODEL  
 [W] : ONLY 120V/220V MODEL  
 [X] : ONLY MILITARY MARKET MODEL  
 [A] : ONLY AUSTRALIAN MODEL  
 [B] : ONLY BRITISH MODEL

NOTE: THE COMPONENTS IDENTIFIED BY MARK **△** ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.





CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Plate</b> 27300732	Bus

#### TONE AND MUTING SWITCH PC BOARD (NASW-2974-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Diodes</b>	
D711	225137CG or 225137CY or 225137DG or 225137DY	SEL2413E CG, LED SEL2413E CY, LED SEL2413E DG, LED SEL2413E DY, LED
D712, D713, D714	225142DX2	SEL2913K DX2, LED
	<b>Capacitors</b>	
C351, C352	354782299	0.22 $\mu$ F, 50V, Elect.
C353, C354	354784799	0.47 $\mu$ F, 50V, Elect.
	<b>Switches</b>	
S311, S312	25035540	NPS-162-122-L502
S314	25035541	NPS-142-L503
	<b>Socket</b>	
JL701	25050267	NSCT-3P95
	<b>Holder</b>	
	27190493-1	(LED-3)

#### TONE CONTROL CIRCUIT PC BOARD (NAAF-2975-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Capacitors</b>	
C315, C316	379128225	8200pF, 50V, Film (DEW)
C317, C318	379125625	5600pF, 50V, Film (DEW)
C319, C320	379121025	1000pF, 50V, Film (DEW)
C321, C322	379123935	0.039 $\mu$ F, 50V, Film (DEW)
C325, C326	379128235	0.082 $\mu$ F, 50V, Film (DEW)
	<b>Resistors</b>	
R317	5148107	N16RGMC250KMN25, Variable
R321	5148108	N16RGM11C219K25, Variable
R323	5144001	N16RQM11C139K176K25, Variable
R337	5148113A	N16RGM11C176K25, Variable
	<b>Switches</b>	
S309, (S310)	25035539	NPS-142-122-L501
	<b>Sockets</b>	
P101, P102	2000676	NSAS-6P632

#### INPUT SELECTOR SWITCH PC BOARD (NASW-2976-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Switches</b>	
S301~S308	25035538	NPS-742-162-L500

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Sockets</b>	
P103	2000551	NSAS-6P507
P301	2000564	NSAS-6P520
P303	2000607	NSAS-18P563
JL103	25050267	NSCT-3P95
P351, P354	25050272	NSCT-8P100
P352, P353, P356	25050267	NSCT-3P95
P355	25050273	NSCT-9P101
	<b>Plugs</b>	
P302	25055137	NPLG-7P121
P501	25055133	NPLG-3P117
	<b>Holder</b>	
	27190494A	(LED-4)

#### DISPLAY LED PC BOARD (NADIS-2977-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Diodes</b>	
D302~D308	225137DG or 225137DY or 225137CG or 225137CY	SEL2413E DG, LED or SEL2413E DY, LED or SEL2413E CG, LED or SEL2413E CY, LED
D311~D316, D301	225142CX1 or 225142CX2 or 225142DX1 or 225142DX2	SEL2913K CX1, LED or SEL2913K CX2, LED or SEL2913K DX1, LED or SEL2913K DX2, LED
	<b>Plug</b>	
P303	25055190	NPLG-9P174
	<b>Socket</b>	
JL357	25050272	NSCT-8P100

#### POWER SWITCH PC BOARD (NASW-2978-1, NASW-2978-1A, NASW-2978-1C)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Switch</b>	
S901	25035398	NPS-111-L362P
	<b>Capacitor</b>	
C991	3500065A	0.01 $\mu$ F, AC400V/125V (IS)
	<b>Fuse holder</b>	
F901a	250113	S-N5051 [D][W][X]
F902a	25050065	YSH403T [G][W][X][A][B]

#### EQUALIZER CIRCUIT PC BOARD (NAAF-2979-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>ICs</b>	
Q105	222570	NJM4560DX
	<b>Transistors</b>	
Q101~Q104	2212185 or 2212186	2SK170 GR or 2SK170 BL
	<b>Coils</b>	
L301, L302	231069A	NCH-1119

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Capacitors</b>		
C105, C106	372122714	270pF, 50V, Styrene
C107, C108	372121014	100pF, 50V, Styrene
C109, C110	379122225	2200pF, 50V, Film (DEW)
C111, C112	379122234	0.022 $\mu$ F, 50V, Film (DEW)
C113, C114	379121834	0.018 $\mu$ F, 50V, Film (DEW)
C115, C116	379124734	0.047 $\mu$ F, 50V, Film (DEW)
C117, C118	391222227	2200 $\mu$ F, 6.3V, Elect.(MUSE)
C119, C120	391280227	2.2 $\mu$ F, 50V, Elect.(MUSE)
C121, C122	379121225	1200pF, 50V, Film (DEW)
C131, C132	354754719	470 $\mu$ F, 25V, Elect.
<b>Terminals</b>		
P191	25045171	NPJ-4PDBL-65
P395	25045190	NPJ-2PDBL-74
<b>Plugs</b>		
P101~P103, P301	25055133	NPLG-3P117
<b>Socket</b>		
JL104, JL360	25050267	NSCT-3P95

#### VOLUME CONTROL PC BOARD (NAAF-2980-1)-PARTS LIST

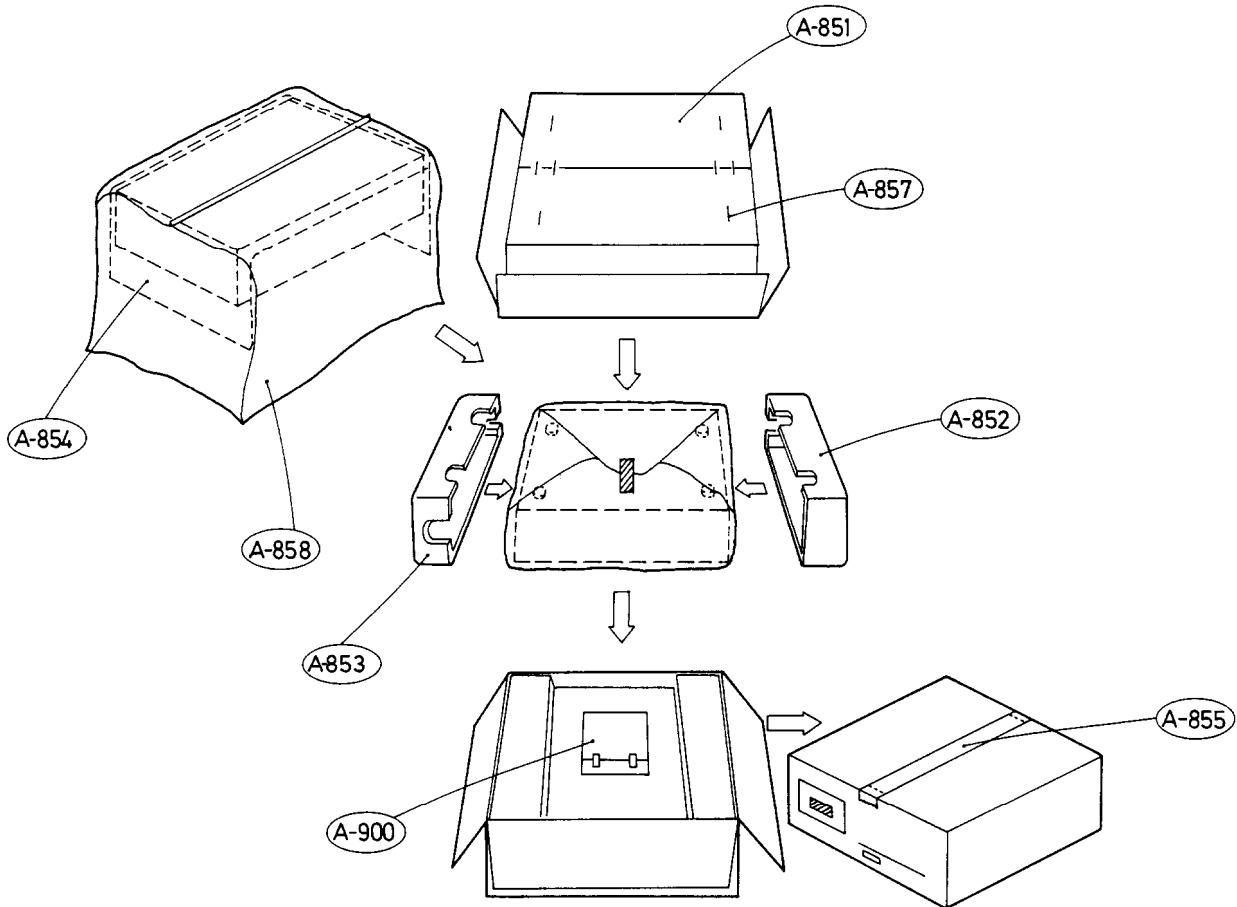
CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Resistors</b>		
R361	5144004	N16RQM100KBT100KBT25, Variable
<b>Socket</b>		
P302	2000622A	NSAS-14P578

#### VIDEO TERMINAL PC BOARD (NAETC-2982-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Diodes</b>		
D801, D802	223145	1S2076TD
<b>Relays</b>		
RL801, RL802	25065298	NRL-1P1A-DC12-40
<b>Socket</b>		
JL801	25050268	NSCT-4P96
<b>Terminal</b>		
	25045207	NPJ-4PDBL87

[D]: Only 220V model  
 [G]: Only 240V model  
 [W]: Only 120V/220V model  
 [X]: Only Military market model  
 [A]: Only Australian model  
 [B]: Only British model

# PACKING PROCEDURES



REF. NO.	PART NO.	DESCRIPTION
A851	29051534	MASTER CARTON BOX
A852	29091125-1 A	PAD ASS'Y LEFT
A853	29091126-1 A	PAD ASS'Y RIGHT
A854	29095012-1	SHEET 800X500
A855	260012	DAMPLON TAPE W50 BROWN
A857	282301	STAPLE 16H
A858	29100038A	POLY BAG 720X950
	29360778	LABEL (FLASH) [N]
A900		ACCESSARYBAG
	29341154	INSTRUCTION MANUAL [D][N]
	29341155	INSTRUCTION MANUAL [G][W][A][B]
	29341160	INSTRUCTION MANUAL (I) [G][W]
	29365019	WARRANTY CARD [N]
	29358002E	SERVICE STATION LIST [N]
	25055018	CONVERSION PLUG CV-K-1 [W]
	29100006A	POLY BAG 350X250

NOTE [D]: ONLY 120V MODEL  
 [G]: ONLY 220V MODEL  
 [W]: ONLY 120V/220V MODEL  
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 [A]: ONLY AUSTRALIAN MODEL  
 [B]: ONLY BRITISH MODEL